

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1 (currently amended): An automatic analysis and control system for electroless composite plating solution for automatically analyzing an electroless composite plating solution and performing such a control as to obtain an appropriate bath composition and/or use conditions, wherein, as a technique for measuring the concentration of a metallic component in said plating solution by absorptiometry, said system ~~comprises~~ comprising:

means for measuring transmissivity or absorbance at least two or more different wavelengths after said plating solution is automatically introduced into an analytical cell, and

means for calculating the objective concentration from the measured values and displaying the calculation results.

2. (original) An automatic analysis and control system according to claim 1, wherein at least one of said measurement wavelengths is spectrometrically conditioned so that the half-width is 1 to not more than 100 nm.

3. (previously presented) An automatic analysis and control system according to claim 1, wherein the combination of the measurement wavelengths is obtained by selecting at least one measurement wavelength in a wavelength range of 250 to 350 nm or 450 to 550 nm, and selecting at least one other measurement wavelength not overlapping with said at least one measurement wavelength in a wavelength range of 350 to 450 nm or 550 to 880 nm.

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4 (currently amended): An automatic analysis and control system according to claim 1, wherein ~~a measuring time table is so set that~~ a standing time of not less than 15 sec is secured after the automatic introduction of said plating solution into said analytical cell and before the start of measurement of the transmissivity or absorbance.

5 (currently amended): An automatic analysis and control system according to claim 1, wherein ~~a function of periodically introducing pure water into said analytical cell~~ periodically receives pure water to wash said analytical cell, ~~and measuring said means for measuring~~ measures the transmissivity or absorbance at a set measurement wavelength in the condition where said cell is filled with pure water ~~is provided~~, and the thus measured value is ~~used as a~~ reference value of 100% transmissivity or absorbance zero relative to measured value of transmissivity or absorbance of said plating solution measured in the period before the next similar measurement for pure water.

6. (previously presented) An automatic analysis and control system according to claim 1, wherein a vertically elongate plating solution dwell portion having a cross sectional area of not less than two times of the cross sectional area of a sampling pipe is provided in the course of a sampling passage for introducing said plating solution into said analytical cell, an inlet to said plating solution dwell portion is provided at an upper portion, and an outlet from said plating solution dwell portion is provided at a lower portion, whereby a trap mechanism for preventing fine bubbles in said plating solution from being fed into said analytical cell is provided.

7. (previously presented) An automatic analysis and control system according to claim 1, wherein said electroless composite plating solution is an electroless composite nickel plating solution, and the nickel component in said plating solution is measured.

8 (currently amended): An automatic analysis and control system for electroless composite plating solution for automatically analyzing an electroless composite plating solution and performing control to obtain an appropriate bath composition and/or use conditions as a technique for measuring the concentration of a metallic component in said electroless composite plating solution by absorptiometry, said automatic analysis and control system comprising:

an absorbance measuring unit comprising an absorbance cell, for measuring transmissivity or absorbance of ~~at least one of~~ at least two or more different wavelengths as measured values of said electroless composite plating solution disposed in the absorbance cell; and

a controller for calculating the objective concentration from the measured values and displaying calculation results,

wherein a vertically elongate plating solution dwell portion having a cross sectional area of not less than two times of the cross sectional area of a sampling pipe is provided in a course of a sampling passage for introducing said electroless composite plating solution into said analytical cell, an inlet to said plating solution dwell portion is provided at an upper portion, and an outlet from said plating solution dwell portion is provided at a lower portion.

9 (currently amended): An automatic analysis and control system according to claim-4 ~~8~~, wherein the at least one of different wavelengths is spectrometrically conditioned so that a half-width is 1 to not more than 100 nm.

10 (currently amended): An automatic analysis and control system according to claim-4 ~~8~~, wherein the different wavelengths are obtained by selecting at least one measurement wavelength in a wavelength range of 250 to 350 nm or 450 to 550 nm, and selecting at least

another measurement wavelength not overlapping with said at least one measurement wavelength in a wavelength range of 350 to 450 nm or 550 to 880 nm.

11 (currently amended): An automatic analysis and control system according to claim-1 8, wherein ~~a measuring time table is set so that~~ a standing time of not less than 15 sec is secured after an introduction of said electroless composite plating solution into said analytical cell and before a start of measurement of the transmissivity or the absorbance.

12 (currently amended): An automatic analysis and control system according to claim-1 8, wherein ~~a function of periodically introducing pure water into said analytical cell~~ periodically receives pure water to wash said analytical cell, ~~and measuring said means for measuring~~ measures the transmissivity or the absorbance at a set measurement wavelength in a condition where said analytical cell is filled with pure water ~~is provided~~, and the thus measured value is ~~used as a~~ reference value of 100% transmissivity or absorbance relative to the measured values of transmissivity or absorbance of said electroless composite plating solution measured in a period before the next similar measurement for pure water.

13 (currently amended): An automatic analysis and control system according to claim-1 8, wherein ~~a vertically elongate plating solution dwell portion having a cross sectional area of not less than two times of the cross sectional area of a sampling pipe is provided in a course of a sampling passage for introducing said electroless composite plating solution into said analytical cell, an inlet to said plating solution dwell portion is provided at an upper portion, and an outlet from said plating solution dwell portion is provided at a lower portion, wherein a trap mechanism for preventing fine bubbles in said electroless composite plating solution from being fed into said analytical cell, is disposed upstream of said analytic cell.~~

14 (currently amended): An automatic analysis and control system according to claim ~~4~~ 8, wherein said electroless composite plating solution is an electroless composite nickel plating solution, and a nickel component in said electroless composite nickel plating solution is measured.

15 (previously presented): An automatic analysis and control method for electroless composite plating solution for automatically analyzing an electroless composite plating solution and performing control to obtain an appropriate bath composition and/or use conditions as a technique for measuring the concentration of a metallic component in said electroless composite plating solution by absorptiometry, said automatic analysis and control method comprising:

measuring transmissivity or absorbance of at least one of different wavelengths as measured values of said electroless composite plating solution disposed in the absorbance cell; and

calculating an objective concentration from the measured values and displaying calculation results.

16 (previously presented): An automatic analysis and control method according to claim 15 wherein said measuring transmissivity comprises spectrometrically conditioning the at least one of different wavelengths so that a half-width is 1 to not more than 100 nm.

17 (previously presented): An automatic analysis and control method according to claim 15 wherein said measuring transmissivity comprises obtaining the different wavelengths by selecting at least one measurement wavelength in a wavelength range of 250 to 350 nm or 450 to 550 nm, and selecting at least another measurement wavelength not overlapping with said at least one measurement wavelength in a wavelength range of 350 to 450 nm or 550 to 880 nm.

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18 (previously presented): An automatic analysis and control method according to claim 15 wherein said measuring transmissivity comprises setting a measuring time table so that a standing time of not less than 15 sec is secured after an introduction of said electroless composite plating solution into said analytical cell and before a start of measurement of the transmissivity or the absorbance.

19 (previously presented): An automatic analysis and control method according to claim 15 further comprising periodically introducing pure water into said analytical cell to wash said analytical cell and measuring the transmissivity or the absorbance at a set measurement wavelength in a condition where said analytical cell is filled with pure water, and the thus measured value is used as a reference value of 100% transmissivity or absorbance relative to the measured values of transmissivity or absorbance of said electroless composite plating solution measured in a period before the next similar measurement for pure water.

20 (previously presented): An automatic analysis and control method according to claim 15, further comprising preventing fine bubbles in said electroless composite plating solution from being fed upstream into said analytical cell, at a vertically elongate plating solution dwell portion having a cross sectional area of not less than two times of the cross sectional area of a sampling pipe in a course of a sampling passage for introducing said electroless composite plating solution into said analytical cell, an inlet to said plating solution dwell portion at an upper portion, and an outlet from said plating solution dwell portion at a lower portion.

21 (previously presented): An automatic analysis and control method according to claim 15, wherein said electroless composite plating solution is an electroless composite nickel plating

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solution, and a nickel component in said electroless composite nickel plating solution is measured.